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METHOD OF TREATING KNITTED GOODS CONTAINING SHRINKABLE FIBRES AND PRODUCTS THEREOF

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It is known, particularly from French Patent No. 898,309 of the 27th September 1943, that it is possible to utilize drawn polyvinyl chloride fibres in combination with other, non-shrinkable fibres in order to obtain cloque or creping effects, or to close the pores of a fabric or the mesh of knitted goods.

The present invention has for an object a new method of shrinking which makes it possible to obtain, starting with knitted goods, textile fabric articles possessing after treatment a very close structure no longer reminiscent of the initial appearance of the knitted goods but having the appearance of a suede fabric or buckskin. These knitted goods are constituted for example of spun yarn containing in intimate mixture shrinkable fibres of polyvinyl chloride, particularly fibres obtained by carrying into effect French Patent No. 913,919 of the 5th May 1942, and natural, artificial or synthetic fibres which are dyed or undyed and which are markedly less shrinkable under the conditions of treatment (which latter fibres will for convenience of reference hereinafter be called "substantially non-shrinkable").

The invention accordingly provides a method of treating knitted material including threads constituted by intimate mixtures of shrinkable polyvinyl fibres and substantially non-shrinkable fibres, for the purpose of obtaining material having the appearance of a suede fabric or buckskin, characterized in that a plurality of operations of shrinking of the knitted material are carried out, firstly in a moist medium and finally in the dry state, while between the damp and dry shrinking operations are interposed dressing operations such as waterproofing, roughening, teasing, sueding or emerying, and any desired operations in preparation for and of dyeing.

The method of treatment of the present invention may comprise the following phases:

A first rapid shrinking in an aqueous medium of a fabric preferably in the flat state at a temperature between 90 and 100° C., and preferably carried out so that the shrinkage obtained varies for example between 50 and 75% of the total shrinkage required, depending on the texture of the knitted material;

A second shrinking carried out on the fabric rolled on a rotating support in an aqueous medium at a temperature ranging for example from 90 to 100° C., the shrinking time being from one to two hours; preferably so that this second treatment adds to the first shrinking from 10 to 20% of the total shrinkage required;

Operations of preparation for dyeing and of dyeing, if desired;

Dressing operations, such as waterproofing, if desired, and sueding, that is to say: roughening, teasing, shearing, or emerying, these operations being intended to give the fabric the appearance of buckskin;

A third dry shrinking of the fabric without tension, and preferably in the flat state, at a temperature variable with the speed of passage of the knitted material through the apparatus, this temperature being variable between

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110 and 140° C. This last operation brings the shrinkage of the knitted material to the maximum.

The invention further covers as new industrial products, fabrics or articles for whatever purpose as obtained by carrying out the aforesaid method, which products it was impossible to obtain by previously known methods, wherein the shrinking was carried out in a single operation and in the same wet or dry medium.

There will now be given two examples of performance of the method, which are intended to illustrate the invention without however limiting the same in any way.

Example 1

The fabric to be treated is made up of threads constituted by an intimate mixture of 70% of viscose fibres in the form of staple and 30% of drawn polyvinyl chloride fibres prepared for example in accordance with Example 3 of French Patent No. 913,919 mentioned above. This fabric is knitted on a circular interlock knitting machine of a suitable gauge for the metric number.

The fabric is first cut in the lengthwise direction, along a slip-stitch where possible, so as to obtain a flat fabric which can be treated breadthwise.

A fabric of this kind is introduced into a vat filled with water brought to and maintained at boiling point throughout the entire operation. The length of the vat may be 5 to 10 metres and the fabric is transported while submerged without tension, at a speed which may vary between 5 and 10 metres per minute.

The fabric is cooled at the outlet of the vat by passing same between the rolls of a foulard press of classical type whereby water present in the fabric is expelled. As a result of the above treatments the fabric undergoes a first shrinkage in the flat state and over the width thereof.

After this first shrinking the fabric is introduced into a reeling vat of conventional type filled with cold water and the water is progressively brought to boiling point. This temperature is maintained for one or two hours while the fabric in the rolled upstate is turned in the vat, after which the bath is cooled by the introduction of cold water. The fabric is then washed and bleached, either spread out over its full width or rolled up in tubular form, in a washer of conventional type.

The fabric is then vat dyed with suitable dyestuffs and by suitable processes.

After dyeing, the fabric is partly dried by suction or by a foulard press. It is then further dried, either while stretched out mechanically at a temperature which may vary between 60 and 80° C., or in the open air after being spread out.

After drying, waterproofing is carried out by impregnation in a bath containing either emulsified waxes or a chromium stearochloride, or any other waterproofing agent.

A further drying of the fabric is carried out under the same conditions as after dyeing; all traces of folds are then eliminated by passing through a vaporising tentering machine of conventional type, and on falling from the tentering machine the fabric is passed several times vigorously over a metallic teaser, with and against the nap.

This teasing operation is followed by the shearing operation on a table shearer, whereof which several passages may be necessary, as the nap obtained by teasing must be plain and cut very short, in order to obtain a very fine sueded appearance.

The fabric is again passed over the vaporising tentering machine, in order to remove the folds and creases, so that it may be in perfect condition when subjected to the following operation, that is to say when introduced into a machine having hot air circulation compartments where the temperature is raised to between 105 and 140° C. In the last compartments. The drive is obtained with the

aid of a series of rollers disposed at the upper part of the machine; the fabric rests flat on the rollers and travels towards the outlet of the machine without any tension either lengthwise or breadthwise. The speed of passage may vary between 5 and 10 metres per minute depending on the length of the machine. After this operation of shrinking and fixing, the fabric must rest in regular folds for cooling, for a time which may vary between 5 and 15 hours. After cooling, the fabric is passed over a vaporising tentering machine for final equalisation, and finally it is wound on a tube.

Example II

The fabric to be treated is composed of threads obtained from intimate mixing of 80% of wool and 20% of drawn polyvinyl chloride fibres. It is knitted on a rib frame.

All the operations indicated in Example I up to and including the first tentering are carried out. However, the washing of the fabric and also the dyeing are effected with products and by a method suitable for wool.

According to the effect desired, either the fabric may be teased and sheared, or if desired to retain its clear and close appearance, these operations may be eliminated.

Final shrinking and fixing are then proceeded with as in Example I.

Example III

The fabric to be treated is composed of threads obtained from intimate mixing of 65% of wool, 20% of polyvinyl chloride fibres and 15% of viscose. It is knitted on a suitable rib frame.

All the operations indicated in Examples I and II are carried out. Final shrinking and fixing are then proceeded with as in Example I.

Example IV

The fabric to be treated is composed with threads obtained from mixing of 60% of wool, 10% cotton and 15% of polyvinyl chloride fibres.

All the operations indicated in Examples I and II are then carried out and final shrinking and fixing are proceeded with as Example I.

Example V

The fabric to be treated is composed with threads obtained from mixing of 70% of superpolyamide (nylon) and 30% of polyvinyl chloride fibres. This fabric is knitted on a circular interlock knitting machine.

All the operations indicated in Example I are carried out. However the washing of the fabric and also the dyeing are effected with products and by a method suitable for superpolyamides.

It will be clearly understood that the invention is not limited to the examples described above and that it extends to several variants. Thus:

1. The percentage of shrinkable fibres may vary in the intimate mixture, in any suitable proportions.

2. The intimate mixtures may contain, together with the shrinkable fibres, one or more sorts of non shrinkable fibres.

3. In order to obtain the sueded or buckskin appearance, an emerying machine may be used instead of a metallic teaser.

4. The shearing of the fabric may be eliminated, depending on the appearance of the fabric and the use to which it is to be put.

5. Any machine permitting the action of heat on the fabric without tension may be suitably employed for the operations of shrinking and fixing, and so on.

6. The various stitches obtainable on mesh frames are compatible with the process of the invention.

7. On hosiery frames threads such as those defined above and other threads not containing shrinkable fibres can alternate.

8. The component fibres can be dyed before weaving,

in which case the operations of dyeing mentioned above are not required.

Knitted goods treated according to the present invention are utilisable for the production of clothing, furniture and vehicle upholstery, synthetic leather goods, or for the production of gloves, footwear, and so on.

What I claim is:

1. A process for treating fabric knitted from threads having a fiber mixture of polyvinyl chloride and relatively non-shrinkable fibers, comprising shrinking said fabric in hot water, subjecting said water treated fabric to mechanical abrasion, and further shrinking said abraded fabric in a heated dry environment.

2. A process for treating fabric knitted from threads having a fiber mixture of polyvinyl chloride and relatively non-shrinkable fibers, comprising first rapidly shrinking said fabric in water heated to 90-100° C., cooling said fabric, additionally shrinking said fabric in a boiling water bath, subjecting said water treated fabric to mechanical abrasion, and further shrinking said abraded material in a dry environment heated to 110-140° C.

3. A process as claimed in claim 2 wherein said threads have a fiber mixture of 70% viscose fibers in the form of staple and 30% polyvinyl chloride.

4. A process as claimed in claim 2 wherein said threads have a fiber mixture of 80% wool and 20% polyvinyl chloride.

5. A process as claimed in claim 2 wherein said threads have a fiber mixture of 65% wool, 15% viscose and 20% polyvinyl chloride.

6. A process as claimed in claim 2 wherein said threads have a fiber mixture of 60% wool, 10% cotton and 15% polyvinyl chloride.

7. A process as claimed in claim 2 wherein said threads have a fiber mixture of 70% nylon and 30% polyvinyl chloride.

8. A process for treating fabric knitted from threads having a fiber mixture of 15 to 30% polyvinyl chloride and 70 to 85% of relatively non-shrinkable fibers, comprising passing said fabric without tension through a water bath heated to 90-100° C. for about 1 minute, cooling said fabric, rolling said fabric along its longitudinal axis, circulating said rolled fabric through a second water bath, raising the heat of said second water bath to the boiling point after the entry of said rolled fabric, maintaining said boiling point for 1 to 2 hours, cooling said bath, removing said rolled fabric from said bath, unrolling said fabric, passing said fabric over a teaser with and against the nap, shearing said teased fabric to obtain a suede appearance, and passing said sheared fabric through circulating hot air at about 105-140° C. without tension on the fabric.

9. A preshrunk fabric resulting from the process of claim 1.

10. A preshrunk fabric resulting from the process of claim 2.

11. A preshrunk fabric as claimed in claim 10 wherein said threads have a fiber content of 80% wool and 20% drawn polyvinyl chloride.

12. A preshrunk fabric as claimed in claim 10 wherein said threads have a fiber mixture of 65% wool, 15% viscose and 20% polyvinyl chloride.

13. A preshrunk fabric as claimed in claim 10 wherein said threads have a fiber mixture of 60% wool, 10% cotton, and 15% polyvinyl chloride.

14. A preshrunk fabric as claimed in claim 10 wherein said threads have a fiber mixture of 70% nylon and 30% polyvinyl chloride.

15. A preshrunk fabric as claimed in claim 10 wherein said threads have a fiber mixture of 70% viscose fibers in the form of staple and 30% polyvinyl chloride.

16. A process for treating fabric knitted from threads having a fiber mixture of polyvinyl chloride and relatively non-shrinkable fibers, comprising shrinking said fabric in hot water, subjecting said water treated fabric to

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mechanical abrasion, shearing and further shrinking said abraded fabric in a heated dry environment.

17. A process for treating fabric knitted from threads having a fiber mixture of polyvinyl chloride and relatively non-shrinkable fibers, comprising first rapidly shrinking said fabric in water heated to 90-100° C., cooling said fabric, additionally shrinking said fabric in a boiling water bath, subjecting said water treated fabric to mechanical abrasion, shearing and further shrinking said abraded material in a dry environment heated to 110-140° C. 10

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